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SMCAR-AEP (1mm)

1 SEP 1994

MEMORANDUM FOR Commander, Defense Technical Information Center,  
Building 5, Cameron Station, Alexandria, VA,  
22304-6145

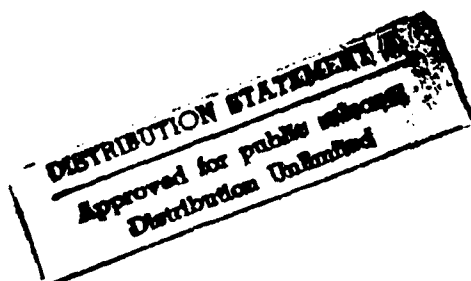
SUBJECT: Inclusion of Performance Oriented Packaging Test Report into  
DLA Data Base

1. The enclosed report (DOD POP HM TR/AYD 94-018) entitled:  
"Performance Oriented Packaging Testing of XM929 White Phosphorus  
Filled Body Assemblies for 120mm Mortar Packed in a Plywood  
Container" is hereby submitted for formal release. Notification of  
release should be sent to the letterhead address.
2. If there are any questions or comments regarding this report,  
contact Mr. D. Kirshteyn at 201-724-2173 (DSN 880-2173).

*Eugene Farrell*

Encl  
as

EUGENE FARRELL  
Acting Chief, Packaging Division



94-32057



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## REPORT DOCUMENTATION PAGE

Form Approved  
OMB No 0704 0188  
Exp Date Jun 30, 1986

1a REPORT SECURITY CLASSIFICATION <b>UNCLASSIFIED</b>			1b RESTRICTIVE MARKINGS None	
2a SECURITY CLASSIFICATION AUTHORITY N/A			3 DISTRIBUTION/AVAILABILITY OF REPORT Distribution Statement A. Approved for public release; distribution is unlimited	
2b DECLASSIFICATION/DOWNGRADING SCHEDULE N/A				
4. PERFORMING ORGANIZATION REPORT NUMBER(S) DOD POP HM TR/AYD 94-018			5 MONITORING ORGANIZATION REPORT NUMBER(S)	
6a. NAME OF PERFORMING ORGANIZATION Packaging Division		6b OFFICE SYMBOL (If applicable) SMCAR-AEP	7a NAME OF MONITORING ORGANIZATION	
6c. ADDRESS (City, State, and ZIP Code) US Army ARDEC Picatinny Arsenal, NJ 07806-5000			7b. ADDRESS (City, State, and ZIP Code)	
8a. NAME OF FUNDING / SPONSORING ORGANIZATION		8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8c. ADDRESS (City, State, and ZIP Code)			10. SOURCE OF FUNDING NUMBERS	
			PROGRAM ELEMENT NO.	PROJECT NO.
			TASK NO.	WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) Performance-Oriented Packaging (POP) testing of XM929 WP Body Assy for 120mm Mortar Packed in a Plywood Box				
12. PERSONAL AUTHOR(S) Dmitry Kirshteyn, Mechanical Engineer				
13a. TYPE OF REPORT Final	13b. TIME COVERED FROM _____ TO _____	14. DATE OF REPORT (Year, Month, Day) 94-08-03	15. PAGE COUNT 4	
16. SUPPLEMENTARY NOTATION				
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SUB-GROUP	Performance-Oriented Packaging POP Body Assy., XM929 120 mm Mortar 12961145	
19. ABSTRACT (Continue on reverse if necessary and identify by block number)				
<p>This report contains test results conducted on the XM929 WP Body Assy. for 120 mm Mortar packaged in plywood box per drawing 12961145. The tests were conducted in accordance with requirements of 49 CFR part 107. The packaging is submitted for Performance-Oriented Packaging certification.</p>				
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED	
22a. NAME OF RESPONSIBLE INDIVIDUAL Dmitry Kirshteyn			22b TELEPHONE (Include Area Code) (201) 724-2173	22c OFFICE SYMBOL SMCAR-AEP

DTIC QUALITY INSPECTION 3

I. Report Number: DOD POP HM TR/AYD 94-018

II. Title: Performance-Oriented Packaging Testing of XM929  
White Phosphorus Filled Body Assemblies for 120mm Mortar  
Packed in a Plywood Container.

Author: Dmitry Kirshteyn

Performing Activity: U.S. Army Armament Research,  
Development and Engineering Center (ARDEC)

Address: Department of the Army  
Commander, U.S. Army ARDEC  
Attn: SMCAR-AEP (Bldg. 455)  
Picatinny Arsenal, NJ 07806-5000

Date: August 1994

Distribution Statement A

Approved for public release; distribution is unlimited.

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DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
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1. Data:

Container:

Type: Box, Plywood  
UN Code: 4D  
Specification Number: None  
Material: Plywood  
Dimensions: 75.72cm X 75.72cm X 62.23cm (29 13/16" X 29  
13/16" X 24 1/2")  
Gross Weight: 382 kg (840 lbs)  
Drawing: 12961145

Product:

Name: XM929 White Phosphorus Filled Body Assembly  
Part Number: 12577607  
United Nations Identification Number: UN 1381  
United Nations Packaging Group: I  
United Nations Proper Shipping Name: PHOSPHORUS, WHITE  
Physical State: Solid  
Number of body assemblies per Container: 25  
NSN: 1315-01-383-9435

2. Reference Material:

- a. Federal Register, "49 CFR Part 107-179"
- b. United Nations, "Transport of Dangerous Goods"

### 3. Background:

This report details the Performance-Oriented Packaging (POP) test performed on XM929 Inert Filled Body Assy packed in a plywood box IAW dwg. 12961145. 25 XM929 inert Filled Body Assy were utilized to simulate the proper content weights. The weight of the tested packed out plywood boxes was 919 lbs. The tested weight is larger than the actual tested weight due to the addition of extra weights as a safety factor. The method of pack was consistent with DWG. 12961145.

### 4. Testing:

#### a. Vibration Test (178.608):

##### Procedure-

One container was vibrated on a vibration table unrestrained for a two hours period. The peak-to-peak displacement was one inch and the frequency was 210 cycles per minute. This frequency was sufficient to allow the pack to become completely airborne enabling a 1/16" piece of strapping material to be slid underneath the pack during testing.

##### Results-

After the test the container experienced no structural damage; there was no spillage of contents; the passing criteria was met.

#### b. Drop Test (178.603):

##### Procedure-

Three containers were utilized for the drop tests. The container that had been previously vibrated was reused to drop in the three orientations: flat on the bottom, flat on the top, flat on long side. The second container was dropped flat on the short side. The third container was dropped on a corner. The height for all five drops was 1.8 meters (5.9 feet).

##### Results-

There was no significant damage on the first four drops. On the 5th drop on the corner one support and one middle strap broke. The impact corner also sustained minor damage. However the contents remained inside the container and the package was capable of being handled without danger of spillage. Based on the results, it was determined that the passing criteria was met.

c. Stacking Test (178.606):

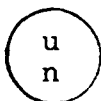
Procedure:

A dead load of 6,440 lbs was applied to the top of single packed plywood container for 24 hour period. This simulates a stack height of 16 feet of identical packages.

Results-

The container adequately supported the load, satisfying the passing criteria.

5. Based on above equivalent POP Testing, the following POP symbol has been applied to plywood containers IAW Drawing 9313721.



4D1/X418/S/\*\*  
USA/DOD/AYD

— INSERT THE LAST TWO DIGITS  
OF YEAR PACKED